

New York City Health and Nutrition Examination Survey

A model for urban health surveillance

Thorpe et al. (1) are to be commended for undertaking a comprehensive evaluation of glycemic status in adults from New York City. Their article represents the efforts of a health and nutrition survey within a large metropolitan area, the New York City (NYC) Health and Nutrition Examination Survey (HANES), and provides very useful information concerning the prevalence of hyperglycemia and control of diabetes in an urban setting. Such efforts have been undertaken in the U.S. by way of national surveys of the populace in terms of lifestyle behaviors and risk factor levels over several decades (2–4), but a survey that used population-based methods in a single city is new, provides valuable information, and may well serve as a model for the future.

The study by Thorpe et al. reports that diabetes affects 12.5% of adults living in New York City and that the frequency of pre-diabetes, which was previously called “impaired fasting glucose,” was almost double that (23.5%). Using the 1997 American Diabetes Association criteria for diabetes and data from the Third National Health and Nutrition Examination Survey (NHANES III, 1988–1994), the investigators reported that the prevalence of impaired fasting glucose was 6.9%, undiagnosed diabetes 2.8%, and diagnosed diabetes 5.1% (5). Previously, Harris et al. expressed concern that the prevalence of diabetes in American adults aged 40–74 years had increased from 8.9% in 1976–1980 to 12.3% in 1988–1994. The 1999–2003 NHANES estimates of diabetes are generally 6.6% at ages 40–59 years and ~15.5% after age 60 years, which suggests that the national prevalence of diabetes after age 40 years was relatively stable from 1988 to 2003 (6). From the NYC HANES data for 2004 that are shown in Table 1 of the study by Thorpe et al., it can be estimated that the prevalence of diabetes in New Yorkers aged 40–74 years is ~17%, which is even greater than the frequencies reported by Harris et al. (5) and Cowie et al. (6).

The general design and ages included by Thorpe et al. for NYC HANES and NHANES are similar, but the estimated prevalence of diabetes and impaired fasting glucose levels are much higher in the more recent NYC HANES data. The very high frequencies reported by Thorpe et al. are very disconcerting for some of the subgroups that were investigated: the prevalence of diabetes was 28.3% in adults >60 years of age, and diabetes was more common in blacks, Hispanics, and Asians in comparison with whites.

Population research has generally shown that approximately one-third to one-half of people with diabetes are unaware of their condition. Thorpe et al. measured fasting glucose levels to identify undiagnosed diabetes. The overall results from Fig. 1 in the study by Thorpe et al. show that 3.8% of the 12.5% of New Yorkers with diabetes, which amounts to a relative proportion of 30%, were not previously aware of the condition until the glucose testing was undertaken. Subgroup analyses concerning the relative frequency of undiagnosed diabetes were generally similar for both sexes, at various ages, across different ethnicities and races, with respect to birth location, and according to income status.

Across the U.S., it has been shown in large surveys that overweight (BMI 25–29.9 kg/m²) affects approximately one-third of adults and that obesity (>30 kg/m²), similarly, affects approximately one-third of adults. On a national basis, the rising incidence and prevalence of diabetes have been most highly associated with greater adiposity (7). Among normal-weight individuals, with a BMI <25 kg/m², the frequency of diabetes in NYC HANES was low and ranged from 1 to 8% across the ethnic and racial groups reported in the study by Thorpe et al. On the other hand, among overweight individuals, the prevalence of diabetes ranged from 9 to 22%, and among those who were obese, the prevalence of diabetes ranged from 14 to 33%. A higher prevalence of diabetes among obese individuals

is what we might expect, but the absolute frequencies are alarmingly high for all groups reported (whites, blacks, Hispanics, and Asians), the overweight status is associated with approximately a doubling in the prevalence of diabetes, and obesity is associated with approximately a tripling in the prevalence of diabetes for the New York survey participants.

It is of concern that the NYC HANES results show higher estimates of abnormal glucose levels in Asians relative to whites and other comparator groups. Reports using data from the Behavioral Risk Factor Surveillance system, based on self-reported data, have shown that the prevalence of diabetes is ~60% greater in Asian Americans and that an increased risk for diabetes in this group is present when BMI may not be greatly increased (8). A report from California further suggests that greater detail should be obtained concerning Asian heritage to assess risk for diabetes and cardiovascular risk factors because relatively low coronary heart disease mortality rates were observed for those who were identified as ethnically Japanese or Chinese in comparison with those who were South Asian from India (9).

The population distribution in the U.S. is changing rapidly, with a 130% increase in Census-defined urban areas between 1960 and 2000 (10). The populations of several large cities have grown by 20% or more (11). Immigration also increases the diversity of cities. In 1970, the U.S. foreign-born population was 9.6 million (<5% of the population) but had increased to 32.5 million by 2002 (about 12%) (12). The recent immigration trend is also characterized by increasing diversity, as the immigrants come mainly from Latin America and Asia—a pattern distinct from the predominantly European immigration in the past. This new pattern has resulted in an increasingly heterogeneous U.S. population ethnically and culturally and in terms of health (13). National surveys, such as

NHANES, do not adequately capture the contemporary diversity of America.

Starting with the National Health Survey Act of 1956, the National Center for Health Statistics has conducted assessments of population health and dynamically adapted sampling and design to keep pace with the changing demography of the U.S. (www.cdc.gov/nchs/about/major/nhanes/history.htm) For example, NHANES I and II sampled the general population, but data for many ethnic groups were not available. The Hispanic HANES was conducted in 1982–1984 to address data gaps for the growing Mexican-American, Cuban-American, and Puerto Rican populations in the U.S. Since 1988, NHANES III and subsequent surveys have oversampled minority groups. Contemporary urban U.S. populations, with a sizeable number of immigrants from Asia and Africa, are still not adequately represented in national surveys. Sample surveys of large cities, such as NYC HANES, are needed to provide a comprehensive picture of the U.S.

NYC HANES provides a model for urban areas where similar studies can be carried out, and comparisons can potentially be made to national HANES data if appropriate sampling frames and recruitment methods are used. Such an approach may be particularly advantageous when specialized ethnic/racial or immigrant groups may be of interest in a locale. The strategy might also be adapted to urban areas outside the U.S., which can permit global comparisons. There is the further potential to follow individuals for mortality or other health events, as well as to conduct similar surveys in the future and to make comparisons over time.

All in all, the NYC HANES 2004 picture does not look so nice: adult New Yorkers are at least as overweight or obese

as has been reported recently in U.S. national data, and the prevalence of diabetes and impaired fasting glucose causes great concern. The Big Apple is sugarcoated, and improvements in obesity and lifestyle will be needed to improve this situation in the future.

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